

Name: _____ Period: _____ Date: _____

Open **peebedu.com** and navigate to **Forest Ecosystem Simulation**. Read through the **Introduction** slides, which cover carrying capacity, logistic growth, community interactions, and energy flow through heterotrophs. Click **Start Exploring** to begin.

Free Response Questions

Question 1 — Conceptual Analysis

Simulation Task: *Enable all eight species and press Start. Watch the population monitor graphs until the simulation reaches equilibrium. Then press Reset, disable both Insect-eating Birds and Herbivore-eating Birds, and run the simulation again. Compare the population graphs for herbivores, insects, trees, and shrubs between the two runs.*

(A) (1 pt) **Describe** the process by which predator-prey interactions regulate population sizes within a community.

(B) (1 pt) **Explain** why removing predatory birds from the ecosystem causes changes in populations at lower trophic levels.

(C) (1 pt) **Predict** what would happen to the tree population if decomposers were removed from the ecosystem.

(D) (1 pt) **Justify** your prediction.

Question 2 — Analyze Model / Visual Representation

Simulation Task: Enable all eight species. Check the Enable Logging option and press Start. Observe how the tree population and all dependent populations respond over time. Then press Reset, disable logging, enable Introduce Exotic Vine instead, and run the simulation again. Compare the population monitor graphs for both disturbance scenarios.

(A) (1 pt) **Describe** the change in the tree and shrub populations that occurs after logging is enabled in the simulation.

(B) (1 pt) **Explain** why ecosystems with fewer species are less resilient to environmental disruptions than ecosystems with greater biodiversity.

(C) (1 pt) **Represent** the flow of energy through the forest community in this simulation by drawing a labeled food web in which arrows show the direction of energy transfer between producers, consumers, and decomposers.

Draw your diagram here.



(D) (1 pt) **Explain** how the introduction of an invasive species into a community can act as a selective pressure on native populations.

8.6.A.1, 8.6.A.2, 8.2.C.2